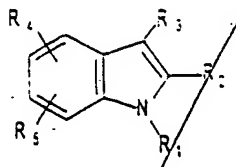
WE CLAIM:

Sub A2

1. A method for inhibiting the growth of neoplastic cells comprising exposing the cells to a growth inhibiting effective amount of a compound of Formula I:



(I)

wherein R_1 to R_3 each represent;

(1) a hydrogen atom,

(2) a lower alkyl group, a lower alkylthio group, or a lower alkoxy-lower alkyl group, or

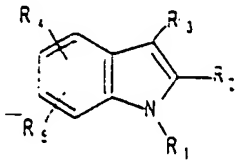
(3) a lower alkyl group, an oxy group, an oxy-lower alkyl group, a lower alkyloxy group, a carbonyl group, a lower alkenyl group, an optionally-substituted imino group, a lower alkylimino group optionally substituted at its nitrogen atom, a thio-lower alkyl group, or a lower alkylthio group; to each group in 3), bonded is an aryl group or a heterocyclic group, or each group in 3) is substituted by an aryl group or a heterocyclic group; and said aryl or heterocyclic group may be further substituted by any of a halogen atom, a nitro group, a lower alkylamino group, an acylamino group, a lower alkyl group, a lower alkoxy group, a halo-lower alkyl group, a lower cycloalkyl group, or an aryl, heterocyclic, aryl-lower alkyl, heterocyclic-lower alkyl, aryl-lower alkyloxy, heterocyclic-lower alkyloxy, aryl-lower alkenyl or heterocyclic-lower alkenyl group optionally substituted by any of a halogen atom or a lower alkyl group,
with the proviso that R_1 to R_3 are not simultaneously hydrogen atoms;

R_4 is selected from the group consisting of hydrogen atom or lower alkyl;

R_5 is selected from the group consisting of carboxyl, an esterified carboxyl group, or an amidated carboxyl group.

Sub A2 cont

2. A method of treating a mammal having precancerous lesions comprising administering a pharmacologically effective amount of a compound of Formula I:



wherein R_1 to R_3 each represent;

(1) a hydrogen atom,

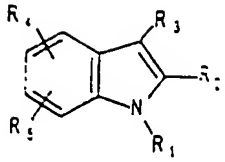
(2) a lower alkyl group, a lower alkylthio group, or a lower alkoxy-lower alkyl group, or

(3) a lower alkyl group, an oxy group, an oxy-lower alkyl group, a lower alkyloxy group, a carbonyl group, a lower alkenyl group, an optionally-substituted imino group, a lower alkylimino group optionally substituted at its nitrogen atom, a thio-lower alkyl group, or a lower alkylthio group; to each group in 3), bonded is an aryl group or a heterocyclic group, or each group in 3) is substituted by an aryl group or a heterocyclic group; and said aryl or heterocyclic group may be further substituted by any of a halogen atom, a nitro group, a lower alkylamino group, an acylamino group, a lower alkyl group, a lower alkoxy group, a halo-lower alkyl group, a lower cycloalkyl group, or an aryl, heterocyclic, aryl-lower alkyl, heterocyclic-lower alkyl, aryl-lower alkyloxy, heterocyclic-lower alkyloxy, aryl-lower alkenyl or heterocyclic-lower alkenyl group optionally substituted by any of a halogen atom or a lower alkyl group,
with the proviso that R_1 to R_3 are not simultaneously hydrogen atoms;

R_4 is selected from the group consisting of hydrogen atom or lower alkyl;

R_5 is selected from the group consisting of carboxyl, an esterified carboxyl group, or an amidated carboxyl group.

3. A method for regulating apoptosis in human cells comprising exposing said cells to an effective amount of a compound of the formula I



(I)

wherein R_1 to R_3 each represent;

(1) a hydrogen atom,

(2) a lower alkyl group, a lower alkylthio group, or a lower alkoxy-lower alkyl group, or

(3) a lower alkyl group, an oxy group, an oxy-lower alkyl group, a lower alkyloxy group, a carbonyl group, a lower alkenyl group, an optionally-substituted imino group, a lower alkylimino group optionally substituted at its nitrogen atom, a thio-lower alkyl group, or a lower alkylthio group; to each group in 3), bonded is an aryl group or a heterocyclic group, or each group in 3) is substituted by an aryl group or a heterocyclic group; and said aryl or heterocyclic group may be further substituted by any of a halogen atom, a nitro group, a lower alkylamino group, an acylamino group, a lower alkyl group, a lower alkoxy group, a halo-lower alkyl group, a lower cycloalkyl group, or an aryl, heterocyclic, aryl-lower alkyl, heterocyclic-lower alkyl, aryl-lower alkyloxy, heterocyclic-lower alkyloxy, aryl-lower alkenyl or heterocyclic-lower alkenyl group optionally substituted by any of a halogen atom or a lower alkyl group,
with the proviso that R_1 to R_3 are not simultaneously hydrogen atoms;

R_4 is selected from the group consisting of hydrogen atom or lower alkyl;

R_5 is selected from the group consisting of carboxyl, an esterified carboxyl group, or an amidated carboxyl group.